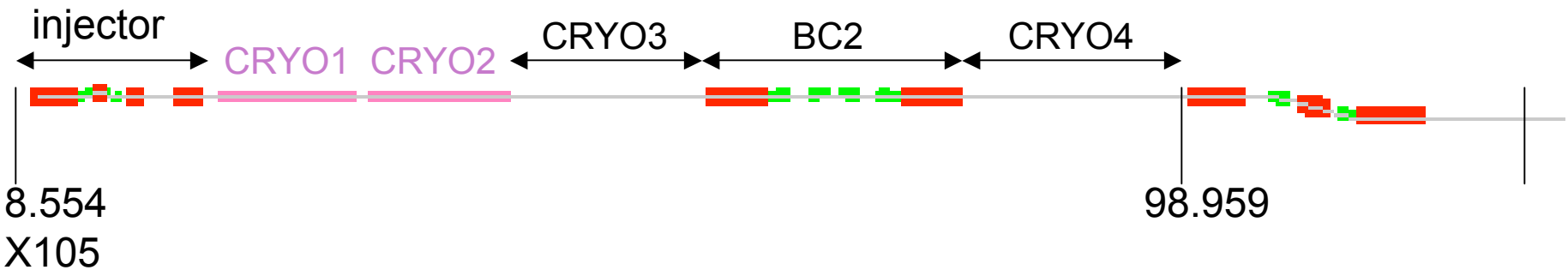
Configuration for AARD

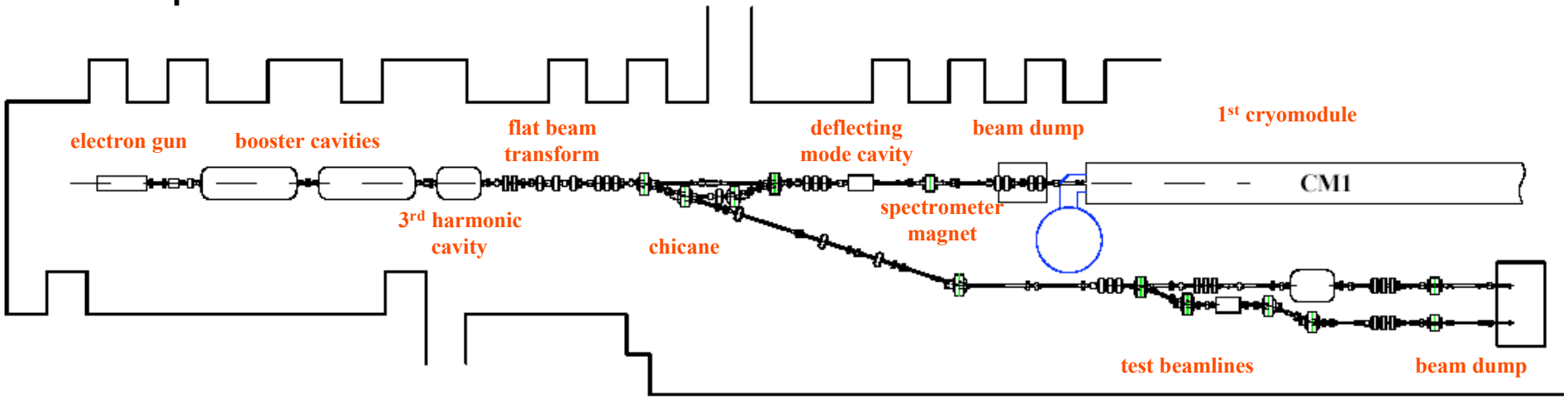


- Phase 1 (first beam): two cryomodules
- Phase 2: 3 cryomodules +BC2 (?)
- Phase 3: 3 cryomodules + BC2 + 4th crymodule

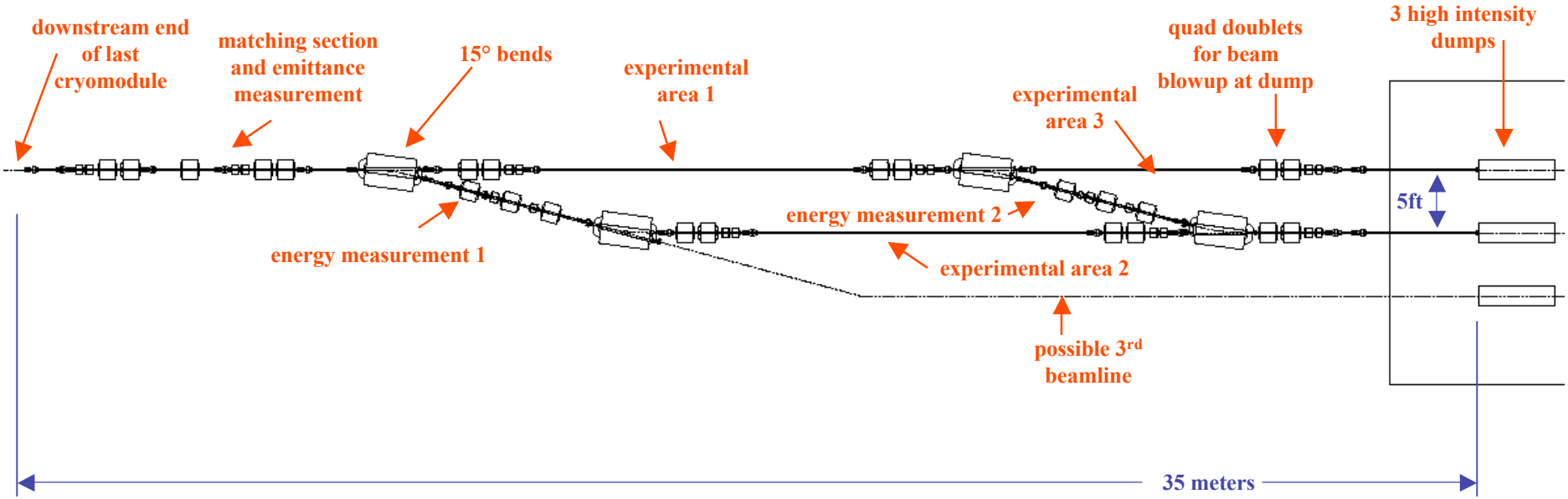
- Five user areas:
  - 2 at low energy (~ 40 MeV)
  - 3 at high energy

Configuration for AARD

LE exp. Area



HE exp. Area



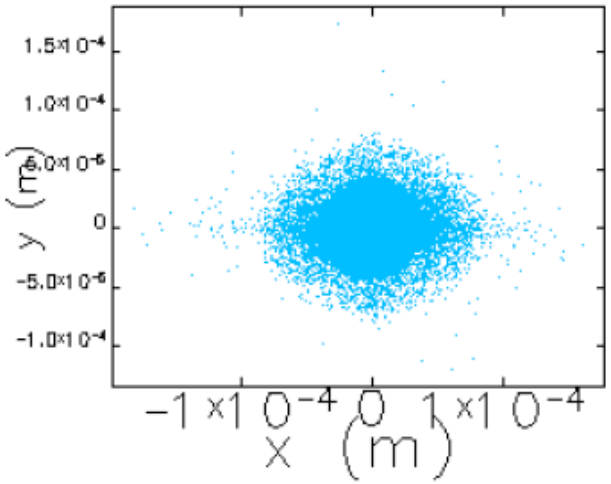
NEED high-peak-current low-emittance beam

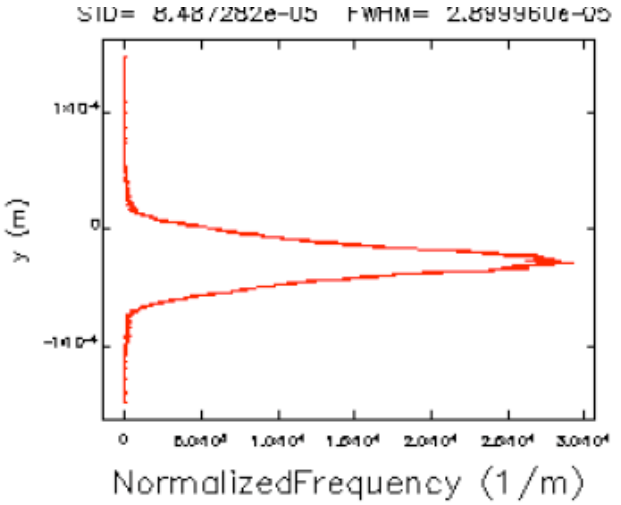
WOULD benefit from compressed beam with low emittance

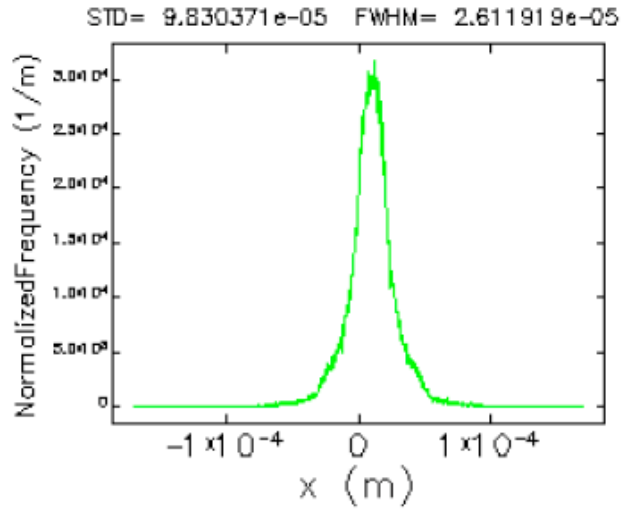
Experiment	Energy	proponent	Motivation/ application
Long. → transverse EEX	low	FNAL/ANL	Proof-of-principle; possible application in FELs and X-ray sources
Slit microbunching generation	low	FNAL	For wakefield investigations;
Ellipsoidal beam generation	low (egun)	NIU/FNAL	Low emittance beams
Microbunching investigations	low, high?	ANL/FNAL	Beam physics; diagnostics
ODR instrumentation development	high	ANL/FNAL	Non-invasive emittance diagnostic
Flat beam transform and image charge undulator	low	FNAL/NIU	Compact UV/ soft X-ray source
Flat beam transform	high	LANL	Proof-of-principle for MaRIE
Emittance exchange	high	LANL	Proof-of-principle for MaRIE
6-D muon cooling	high	IIT/FNAL	Proof-of-principle for muon collider
Optical stochastic cooling	high	IIT	Proof-of-principle; muon collider
γ-ray enhancement by crystal channeling	high	ANL	Unpolarized e^+ source
High gradient wakefield acceleration with dielectric structures	Low?, high?	ANL/NIU	many

Experiment	Energy	proponent	Motivation/ application
PIC lattice test	high	FNAL/Muons Inc	Muon collider
Reverse emittance exchange	Low?, high?	FNAL/Muons Inc	Muon collider
Dielectric Wall Accelerator section	Low? high?	FNAL	Muon collider; induction linac
Measure plasma wakes with long bunch trains	high	USC	Application to 2-beam plasma acceleration
Measure plasma wakes with laser interferometry	high	USC	Application to 2-beam plasma acceleration
Photoproduction of muons @ 300 MeV	high	FNAL	Homeland security; verify production model
Test of integrable beam optics	high	FNAL	Proof-of-principle; future high current proton machines

Beam size at IP (OLD)

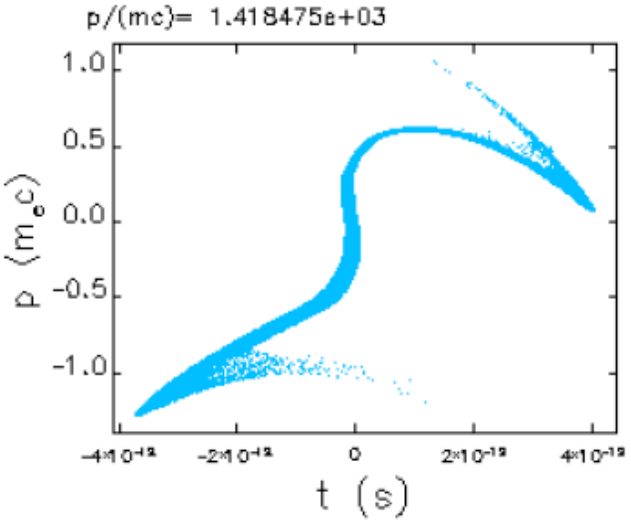


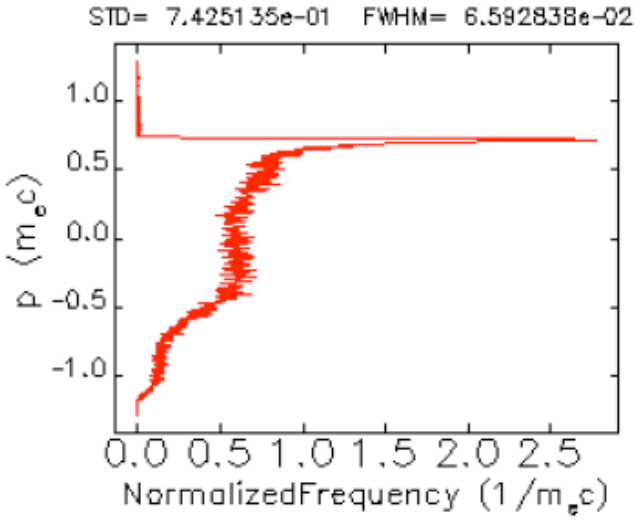


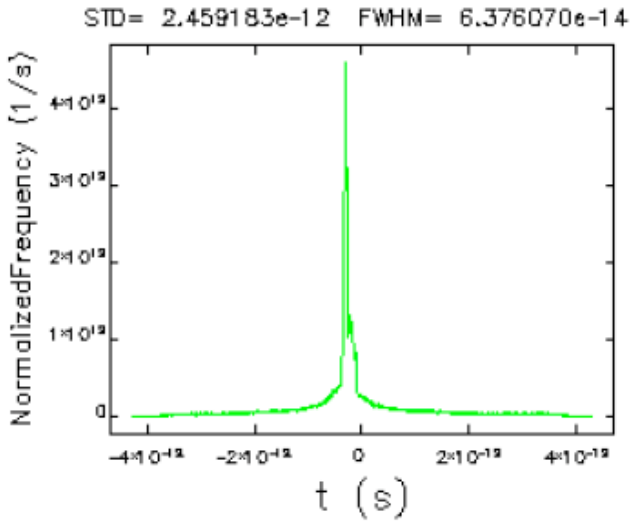


- Q=3.2 nC
- Spot size FWHM ~ 25-30 μm

Beam size at IP (OLD)







- Q=3.2 nC
- Ipeak=4500x3.2=14.4 kA

(Space charge + wakefield not included at high energy